



"Results show that a strong correlation exists between engine wear and the filtration efficiency of solid contamination in the engine lube. It is clearly demonstrated that higher efficiency filtration results in cleaner lube oil and thus less engine wear."
Society of Automotive Engineering; Paper No. 952555

SAVE TIME AND \$\$\$ THROUGH ADVANCED FILTRATION

Interested in saving time, saving money and reducing your liability at the same time?

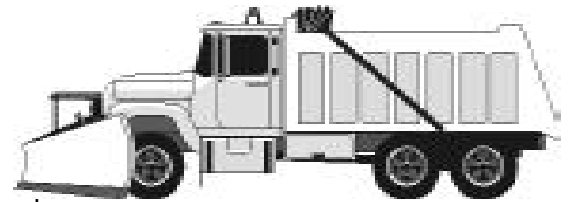
By safely extending your vehicle's oil drain interval you can:

- (reduce purchasing new oil and disposing of waste oil;
- (save labor and vehicle downtime; and,
- (reduce your facility's environmental liability.

Many municipal and commercial fleets around New England are taking advantage of the advances in:

- (oil;
- (oil filtration; and,
- (oil analysis;

and safely extending their oil drain intervals.



About Oil and Changing Oil

Oil must be changed to remove contaminants — such as dirt, soot, water and acids — that are suspended in the oil. Changing the oil replenishes the oil additives which are an extremely important part of the engine oil package. Many facilities routinely change engine oils at a set mileage or time, such as three months or 3,000 miles. But changing oil this frequently may not get the most life out of the oil. Oil does not wear out or break down. It only gets dirty.

Engine manufacturers base their recommended time and mileage drain intervals on statistical data for average use. Manufacturers also have alternate oil drain interval recommendations based on the quality of the oil, which is determined through oil analysis. Depending on use and service, many vehicles may qualify for extended oil drain intervals based on oil analysis results while remaining within the engine manufacturer's maximum allowable intervals.

About Filters & Filtration

Engine manufacturers always include a primary full-flow filter on engines to protect it from large particles (25 to 40 microns) of wear metals, dirt and other contaminants. The Society of Automotive Engineering (SAE) technical papers state, the level of filtration in an engine can have a significant affect on wear rates from abrasive particles. And, it is well established that engine oil filtration that possesses high efficiency in the low micron range will result in reduced engine wear. Tests showed that engine wear can be reduced by as much as 70% by going from a 40 micron filter to a 15 micron filter.



Many fleet maintenance facilities are using advanced filtration systems along with oil analysis to extend the life of their engine oils. Extending drain intervals through improved filtration can save you time, save you money, extend the life of your engine, and help the environment by saving our national resources.

Of the types of wear found in internal combustion engines, abrasive wear is the most common and causes the most damage. The action of abrasive materials removes thin oxide layers which may inhibit corrosion. Wear from abrasion happens when contaminants get between wear surfaces. Once in the oil film, the abrasive particles are able to plow away bearing material. Particles greater than the bearing clearance (22 microns or so) are unable to enter the area while particles smaller than the minimum will remain in the fluid stream and have minimal contact with the surface. The most important particles to control are in the range of the film thickness — from two to 22 microns. Smaller particles, however, may accumulate into larger particles over time and also cause engine wear, as well as larger particles dividing into smaller more harmful particles.

What is Advanced Filtration?

Advanced filtration is designed to remove smaller particles than a primary filter does. A wide variety of advanced filter systems and devices are available.

Bypass filters: With bypass filters about 10% of the oil flow is diverted through the filter, which cleans the oil and returns it directly to the crankcase bypassing the engine. There are several types of bypass filters. The most common include high efficiency paper or synthetic media and centrifuges (spinners). The media type filters are available as a disposable canister or with a replaceable or cleanable cartridge. Both types of filters can remove particles in the one to 10 micron range.

Magnetic coil filters: These filter slip over the full flow filter, and are designed to remove ferrous metal particles.

Why Go To Advanced Filtration?

Why would you want to have a second engine oil filter in addition to the primary filter? Basically, to extend the useful life of the engine oil and the engine. Advanced filters can effectively:

- (remove soot, a major contaminant that limits the life of the oil,
- (control smaller damaging particles, moisture, and other contaminants not removed by the manufacturers filters; and,
- (reduce the wear on the internal parts of the engine.

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Not all vehicles will benefit from using an advanced filter. You need to consider a vehicles age when determining whether to install an advanced filter to justify the expense of the filter.

Find Out More About Advanced Filtration

Any size community can benefit from the time and money savings from advanced filtration. If you're interested in getting more information on advanced filtration or extended oil drain intervals contact Jack Healey of EPA at (617)918-1844.

